

Claims

We claim:

- Supp. 2*
1. A *Borellia burgdorferi* epitope polypeptide with an amino acid sequence selected from the group consisting of:
5 VQEGVQQEGAQQP-(beta-A) (beta-,4)C; EIAAKAIGKKIHQNNG-(beta-A) (beta-A)C; ISTLIKQKLDGLKNE-(beta-A) (beta-A)C; PWAESPKKPE-(beta-A) (beta-A)C; DKKAINLDKAQQKLD-(beta-A) (beta-A)C; ITKGKSQKSLGD-(beta-A) (beta-A)C; and GMTFRAQEGAFLTG-(beta-A) (beta-A)C.
 - 10 2. The composition of matter of claim 1, wherein said epitope polypeptide **comprises** VQEGVQQEGAQQP-(beta-A) (beta-,4)C.
 3. The composition of matter of claim 2, wherein said epitope polypeptide **consists essentially of** VQEGVQQEGAQQP-(beta-A) (beta-,4)C.
 - 15 4. The composition of matter of claim 1, wherein said epitope polypeptide comprises EIAAKAIGKKIHQNNG-(beta-A) (beta-A)C.
 5. The composition of matter of claim 4, wherein said epitope polypeptide consists essentially of EIAAKAIGKKIHQNNG-(beta-A) (beta-A)C.
 - 20 6. The composition of matter of claim 1, wherein said epitope polypeptide comprises ISTLIKQKLDGLKNE-(beta-A) (beta-A)C.
 7. The composition of matter of claim 6, wherein said epitope polypeptide consists essentially of ISTLIKQKLDGLKNE-(beta-A) (beta-A)C.
 - 25 8. The composition of matter of claim 1, wherein said epitope polypeptide comprises PWAESPKKPE-(beta-A) (beta-A)C.
 9. The composition of matter of claim 8, wherein said epitope polypeptide consists essentially of PWAESPKKPE-(beta-A) (beta-A)C.
 - 30 10. The composition of matter of claim 1, wherein said epitope polypeptide comprises DKKAINLDKAQQKLD-(beta-A) (beta-A)C.
 11. The composition of matter of claim 10, wherein said epitope polypeptide consists essentially of DKKAINLDKAQQKLD-(beta-A) (beta-A)C.
 - 35 12. The composition of matter of claim 1, wherein said epitope

polypeptide comprises ITKGKSQKSLGD-(beta-A)(beta-A)C.

13. The composition of matter of claim 12, wherein said epitope polypeptide consists essentially of ITKGKSQKSLGD-(beta-A)(beta-A)C.

5 14. The composition of matter of claim 1, wherein said epitope polypeptide comprises GMTFRAQEGAFLTG-(beta-A)(beta-A)C.

15. The composition of matter of claim 14, wherein said epitope polypeptide consists essentially of GMTFRAQEGAFLTG-(beta-A)(beta-A)C.

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16. A vaccine for immunizing against or treating for Lyme disease, the vaccine comprising an epitope polypeptide with an amino acid sequence selected from the group consisting of: VQEGVQQEGAQQP-(beta-A)(beta-,4)C ; EIAAKAIGKKIHQNG-(beta-A)(beta-A)C ; ISTLIKQKLDGLKNE-(beta-A)(beta-A)C ; PWAESPKKPE-(beta-A)(beta-A)C ; DKKAINLDKAQQKLD-(beta-A)(beta-A)C ; ITKGKSQKSLGD-(beta-A)(beta-A)C ; and GMTFRAQEGAFLTG-(beta-A)(beta-A)C.

17. The vaccine of claim 16, wherein said epitope polypeptide comprises VQEGVQQEGAQQP-(beta-A)(beta-,4)C.

18. The vaccine of claim 17, wherein said epitope polypeptide consists essentially of VQEGVQQEGAQQP-(beta-A)(beta-,4)C.

19. The vaccine of claim 16, wherein said epitope polypeptide comprises EIAAKAIGKKIHQNG-(beta-A)(beta-A)C.

20. The vaccine of claim 19, wherein said epitope polypeptide consists essentially of EIAAKAIGKKIHQNG-(beta-A)(beta-A)C.

21. The vaccine of claim 16, wherein said epitope polypeptide comprises ISTLIKQKLDGLKNE-(beta-A)(beta-A)C.

22. The vaccine of claim 21, wherein said epitope polypeptide consists essentially of ISTLIKQKLDGLKNE-(beta-A)(beta-A)C.

23. The vaccine of claim 16, wherein said epitope polypeptide comprises PWAESPKKPE-(beta-A)(beta-A)C.

24. The vaccine of claim 23, wherein said epitope polypeptide consists essentially of PWAESPKKPE-(beta-A)(beta-A)C.

25. The vaccine of claim 16, wherein said epitope polypeptide comprises DKKAINLDKAQQKLD-(beta-A)(beta-A)C.

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35 38. The composition of matter of claim 31, wherein said
epitope polypeptide comprises PWAESPKKPE-(beta-A)(beta-A)C.

40. The composition of matter of claim 31, wherein said
5 epitope polypeptide comprises DKKAINLDKAQQKLD-(beta-A)(beta-A)C.

42. The composition of matter of claim 31, wherein said
10 epitope polypeptide comprises ITKGKSQKSLGD-(beta-A)(beta-A)C.

44. The composition of matter of claim 31, wherein said
15 epitope polypeptide comprises GMTFRAQEGAFITG-(beta-A)(beta-A)C.

45. The composition of matter of claim 44, wherein said epitope polypeptide consists essentially of GMTFRAQEGAFLTG-(beta-A) (beta-A)C.